PAPER ON
PHILOSOPHY OF LANGUAGE

LANGUAGE IN THE PERSPECTIVE OF NOAM CHOMSKY

By
Andri Purwanto
Illa Amalia
Eulis Rahmawati

PROGRAM STUDI ILMU PENDIDIKAN BAHASA
UNIVERSITAS NEGERI JAKARTA
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1. Introduction

Noam Chomsky is an eminent American theoretical linguist, philosopher, cognitive scientist, logician, political commentator, social justice activist, and anarcho-syndicalist advocate, who radically changed the field of linguistics by stating that language is a uniquely human, biologically based cognitive capacity. He suggested that innate traits in the human brain give birth to both language and grammar. As the most important figure in "cognitive revolution" and "analytic philosophy", Chomsky's wide-ranging influence also extends to computer science and mathematics. Sometimes described as the "father of modern linguistics", Chomsky has spent most of his career at the Massachusetts Institute of Technology (MIT), where he is currently Professor Emeritus, and has authored over 100 books. He has been described as a prominent cultural figure, and was voted the "world's top public intellectual" in a 2005 poll.

2. Early life, Family and Education

Avram Noam Chomsky was born on December 7, 1928 to a middle-class Ashkenazi Jewish family in Philadelphia. His father was the Ukrainian-born William "Zev" Chomsky, who had come to the USA in 1913, and his mother was the Lithuanian-born Elsie Simonofsky. William, the father, was very involved in the study of the Hebrew grammar, teaching it in schools and publishing different papers on it. He also placed a great emphasis on educating people so that they would be "well integrated, free and independent in their thinking, and eager to participate in making life more meaningful and worthwhile for all", a view subsequently adopted by his son Noam.

Noam was the Chomsky family's first child. His younger brother, David Eli Chomsky, was born five years later. The brothers were raised in a Jewish environment, being taught Hebrew and regularly discussing the political theories of Zionism; the family was particularly influenced by the Left Zionist writings which Chomsky later labeled as anti-zionist. Because of his Jewish heritage, Noam Chomsky faced anti-semitism as a child, particularly from the Irish and German communities in Philadelphia.

Chomsky's primary education was at Oak Lane Country Day School, an independent institution that focused on allowing its pupils to pursue their own interests in a non-competitive atmosphere. It was here that he wrote his first article, aged 10, on the spread of fascism, following the fall of Barcelona in the Spanish Civil War. Aged 12, he moved on to secondary education at Central High School, where he joined various clubs and societies but was troubled by the hierarchical and regimented method of teaching that they employed. From age 13, he started traveling to New York and there his political interests would get shaped. His uncle, living there and owning a newspaper stand, would often join other Jewish leftists to debate the issues of the day. Whenever visiting his relatives in New York City, Chomsky also used to visit left-wing and anarchist bookstores, voraciously reading political literature.

He entered the University of Pennsylvania in 1945, where he was attracted to the field of linguistics. Although dissatisfied with the strict structure of the university, he was encouraged to continue by the Russian-born linguist Zellig Harris, who convinced Chomsky to major in the subject. He received his B.A. (1949) and M.A. (1951) in nontraditional modes of study. Chomsky's BA thesis was titled "Morphophonemics of Modern Hebrew". He continued Ph.D. at U. Pennsylvania as well as Harvard; his dissertation was expressed later in the book “Syntactic Structures” (p. 1957). During that time in 1955, he joins MIT as a professor in department of Linguistics & Philosophy. His first work on linguistics, Syntactic Structures, is a book that radically opposed the dominant Harris-Bloomfield trend in the field. The response to Chomsky's ideas ranged from indifference to hostility, and his work proved divisive and caused "significant upheaval" in the discipline. Linguist John Lyons later asserted that it "revolutionized the scientific study of language." In 1959 he attracted further attention for his review of B.F. Skinner's 1957 book Verbal Behavior in the journal Language, in which he argued that Skinner ignored the role of human creativity in linguistics.

Chomsky was a family oriented person from early age whether it was with his parents or with his own family. He entered a romantic relationship with Carol Doris Schatz, whom he had known since they were very young. They were married in 1949 and remained together until her death in 2008. The couple raised three children and even though Chomsky got more and more involved in politics in years to come, he was known as a good father and husband, all his life. His debate quality was well known and the political activism made him famous for a number of times. His research is honored by universities from Calcutta to Chicago. He got honorary degrees from more than forty colleges.

Biographer Robert F. Barsky talked about the passion of Chomsky as follows: "What motivated his [political] interests? A powerful curiosity, exposure to divergent opinions, and an unorthodox education have all been given as answers to this question. He was clearly struck by the obvious contradictions between his own readings and mainstream press reports. The measurement of the distance between the realities presented by these two sources, and the evaluation of why such a gap exists, remained a passion for Chomsky."

There is no doubt that his family and education shaped him what he has become, a symbol of knowledge and intellect.

3. Language in his Life

Chomsky's parents' first language was Yiddish, but Chomsky said it was a "taboo" in his family to speak it. Unlike his father, his mother Elsie spoke "ordinary New York English". He learned Classical Hebrew as a boy, his M.A. thesis was "A Generative phonology of Modern Hebrew". He had students from a number of countries, who had written on other languages such as Japanese, Icelandic, Italian, and Hungarian.

Even in 1945 Chomsky embarked on a general program of study at the University of Pennsylvania, where his primary interest was in learning Arabic. Living at home, he funded his undergraduate degree by teaching Hebrew. In one interview, Prof. Chomsky mentions having taught courses in 'Scientific French' and 'Scientific German' at MIT in the 1950s, when familiarity with these languages was considered useful for students in the sciences and engineering.

There are many very legitimate and well-respected linguists who only make research for one language (Noam Chomsky being one of them). Many critics claim that he was more inclined to English and other European languages than Sanskrit or any Asian or African languages. He had also never had much interest in Modern art and Music where many times a language does pass through generations and evolve. He might have improved his theories if he had taken these in consideration. It is still a myth how many languages he actually knew, but despite this, his works massively influenced the world of languages.

4. Contributions and Achievements

Noam Chomsky became a member of the faculty of the Massachusetts Institute of Technology and performed his services as a visiting professor. Influenced by the ideas of his mentor, Zellig Harris, Chomsky published his famous work, "Syntactic Structures" in 1957. During that era, concepts regarding the origin of language were inspired by behaviorist ideas, for instance those of renowned Swedish Psychologist B. F. Skinner, who advocated that newborn babies had a blank mind (tabula rasa) and that children acquired language by means of learning and mimicry.

Chomsky rejected that belief and argued that human beings were in fact born with the innate ability to realize the generative grammars that constitute every human language. Children make use of this innate ability to learn the languages that they are exposed to. Furthermore, he believed that the basics concepts of language were innate in every human mind and only influenced by one's syntactical environment.

He declared: “Languages are innate and that the differences we see are only due to parameters developed over time in our brains, helping to explain why children are able to learn different languages more easily than adults”.

Chomsky established his linguistic theory in 1965 with “Aspects of the Theory of Syntax”, and in 1975, with “The Logical Structure of Linguistic Theory”. Later works in cognitive science supported his claims. The influence of Chomsky on linguistics is similar to that of Charles Darwin on evolution and biology. His ideas have significant logical implications for various subjects of psychology, and also extends to cognitive science, anthropology, sociology and neurology.

5. The context of linguistics

Chomsky's contributions to theoretical linguistics is highly influential for any linguist who wants to understand the current paradigms. Every “other” school that occurs has to define its position towards Chomsky's theories.

His first book, **“Syntactic Structures”** doesn't move too far away from the existing framework, being in accordance to the “Bloomfieldian” school dominating at that time. He formalized various systems of generative grammar. The concept of *Generative grammar* is a research paradigm initiated by Chomsky, today regarded as a linguistic theory which considers grammar as a system of rules generating exactly the combinations of words which form grammatical sentences in a given language. Generative grammar is mostly preoccupied with the study of syntax, but also with morphology and phonology. Chomsky believed that many properties of a generative grammar come from a universal grammar innate to human brain, and not because they are learned. In his view, the first such generative grammar in a modern sense was “Panini’s grammar”, composed in the 6th century BC in India. After 1950, many approaches of the generative

grammar occurred and also, the **Chomsky hierarchy** brought new ways of comparing and describing them.
Along with the Generative grammar, Chomsky also forwarded an argument that the behaviorist explanations of human behavior are inadequate, thus fueling the "cognitive revolution" that took place in the 1960s and gave birth to **cognitive science**.

The simplest grammars capable of generating an infinite set of sentences with a finite vocabulary and a finite set of possibly recursive rules are called by Chomsky *finite-state grammars*. The modeling of such grammars is borrowed from the *automata* theory which had just emerged in computer science and which he drove one step further. Chomsky proved that the framework of finite-state grammar is insufficient to describe certain sentences in English language because of the possible dependencies between non-adjacent words, themselves separated by structures with the same properties, called "mirror-image" properties.

The second model Chomsky proposed is called *phrase structure grammar*, with a more satisfactory application. This new grammar is powerful and able to describe the whole finite-state grammar, as well as to address the shortages it has. It makes use of labels and tree diagrams to express the syntactic value. Although Chomsky does not prove that there are sentences that cannot be generated with the current model, he claims that some sentences can be only "clumsily" described in this manner.

The third model Chomsky created is called the *transformational grammar*, with considerably extended rules generating much more possible output as before. In contrast to the previous models, the rules can be context-sensitive. A *Transformational grammar* is a generative grammar, especially from a natural language, that involves the use of defined operations ("transformations") to produce new sentences from existing ones. Today's research is inspired from Chomsky's Minimalist program. This system of transformational grammar brought a touch of mathematical description for the language. The mathematical rigor and precision of formulating properties was the best contribution he had to linguistics.

After 20 years of publishing "The syntactic structures", Chomsky's theories were still a matter of controversy among linguists, some of them adopting alternative Chomskyan and post-Chomskyan versions of transformational grammar.

The Chomsky's known works in the linguistics field influenced the area so greatly, that today we can speak of *three phases of language theory*, that are: the combinatoric, the cognitive and the minimalist – "inspired" from more developed sciences: engineering, biology and physics respectively. Chomsky's writings can be mapped to these periods as: "Syntactic Structures" (1957) for combinatoric, "Aspects of a Theory of Syntax" and "Lectures on government and binding" for cognitive, and "The minimalist program" corresponding to the last phase.

The combinatoric stage states that "The fundamental aim of linguistic analysis of language L is to separate the grammatical sequences which are the sentences of L from the ungrammatical sequences which are not sentences of L. The grammar of L will thus be a device that generates all of the grammatical sequences of L and none of the ungrammatical ones" (1957). Thus, all language sentences belong to one of two infinite sets: either well-formed or ill formed. A grammarian should find rules that will generate all the well-formed sentences without any of the ill-formed ones. It is therefore a computational problem, also called a combinatoric problem. This first stage succeeded in developing suitable formal tools for the study of natural-language grammars.

The cognitive era has two parts: an early one and a late one. In "Aspects of a Theory of Syntax", Chomsky emphasizes the question on how young children acquire a language and divides the grammar into *descriptively adequate* and *explanatory adequate*. The era mainly focused on how they go from primary linguistic data (PLD), consisting of well-formed short sentences, to obtaining a grammar for the language that they can use for generating new sentences – and that must have a biological underline. In "Syntactic Structures", Chomsky attempted to develop grammars with combinatoric properties, whereas in "Aspects of a Theory of Syntax", the focus shifted more into the cognitive area and the way native people interiorize rules.

The minimalist era started in early 1990s after Chomsky's paper publication, and it is attempting to answer the central question "why a language has the properties it has". Its main idea is that universal grammar has a perfect design "in the sense that it contains only what is necessary to meet our conceptual and physical needs" [2].

In **"Aspects of the Theory of Syntax"** as well as in "Cartesian linguistics" and "Language and Mind", Chomsky started to consider linguistics in relation to cognitive psychology and philosophy, all because of the aspect of creativity – the fact that children are able to understand and produce a large number of utterances that they have never met before.

6. Connection with computer science

Around 1950s, a new idea emerged in the realm of computing: how to compose computer programs without having to deal with more complicated aspects pertaining to the machine architecture. It was the time for creating formal (programming) language definitions that will be closer to human natural understanding rather than to machine specification. This problem was split into two: first, to design a mathematical language for expressing an algorithm, and second – to translate these programs into machine code. The first problem was resolved with the emergence of a new discipline, called design of computer programs, and the second – by the emergence of compiler design.

The mathematical high-level programming language envisioned was materialized with the advent of Fortran, from 1954, quickly adopted by the scientific community. Later on, the business computing people would also get a language adapted to their needs, named Cobol.

Within this context, there was not much awareness at that time that a PL description can be, itself, a scientific problem. It all changed in Europe with advancing the idea of an "unified programming language". In consequence, Algol and its versions appeared as languages to describe algorithms in official publications.

The language of Algol made use of entities called *blocks* encapsulated between *begin* and *end* keywords. Inside a block, there were typed variables and procedures as well as branches. For the first time, a scientist called John Backus borrowed from linguistics the terms "syntax" and "semantics" that could be as well applied to describe the Algol language. He also introduced the concept of "meta-language" formulas to create program specifications, BNF (Backus Normal Forms). The formulas establish syntactic rules for a valid Algol usage.

In parallel to the BNF meta-language, it was Chomsky's new theories that gained attention. He clarified for the first time what a *language* should mean - "a (possibly infinite) set of sentences, each sentence being composed of a finite set of elements". The set of elements was referred to as the *alphabet*, but not every possible sentence is valid unless it obeys a set of grammar rules.

The meta-linguistic formulas from the Algol 60 Revised Report corresponded to Chomsky's formulas and interpretations. A grammar with rules involving *terminal* and *non-terminal* symbols was called *context-free grammar*, which belongs to Chomsky's "Type 2" languages from his hierarchy. Although this type of language proved inadequate for describing natural languages in linguistics, in the field of computer science it became very important and remained useful until today, especially in the sphere of compilers.

7. Psychology and cognitive science

The Princeton scientist George Miller, who lived the birth of cognitive science, appreciated in 2003 that "Behaviorism was an exciting adventure for experimental psychology but by the mid-1950s it had become apparent that it could not succeed. As Chomsky remarked, defining psychology as the science of behavior was like defining physics as the science of meter reading (…) I was therefore ready for Chomsky's alternative to Markov processes. Once I understood that Shannon's Markov processes could not converge on natural language, I began to accept syntactic theory as a better account of the cognitive processes responsible for the structural aspects of human language. The grammatical rules that govern phrases and sentences are not behavior, they are mentalistic hypotheses about the cognitive processes responsible for the verbal behaviors we observe."

Slowly, the scientific community would disembarrass itself from the behaviorist ideas, as the above-mentioned suggested, that "In 1951, I apparently still hoped to gain scientific respectability by swearing allegiance to behaviorism. Five years later, inspired by such colleagues as Noam Chomsky and Jerry Bruner, I had stopped pretending to be a behaviorist. So I date the cognitive revolution in psychology to those years in the early 1950s." He was later to become one of the founders of cognitive science.

8. Universal Phonetic

The theory of universal phonetics attempts to establish a universal phonetic alphabet and a system of laws. The alphabet defines the set of possible signals from which the signals of a particular language are drawn.

According to this theory, each signal of a language can be represented as a sequence of symbols of the phonetic alphabet. The symbols of the universal phonetic alphabet are not the “primitive elements” of universal phonetic theory. These primitive elements include what have been called (phonetic) distinctive feature properties such as voicing, frontness–backness, stress, etc. A symbol of the phonetic alphabet is properly to be regarded as a set of features each with a specified value. A signal then is represented as a sequence of such sets.

Three obvious properties of language are reflected in a phonetic theory of this sort. The first is its discreteness – the fact that only a determinable finite number of signals of any given length can be non-repetitions. The second property is the un-boundedness of language. The fact that a signal can be of arbitrary length, so that a language will contain infinitely many semantically interpreted signals. In addition to these formal properties, a phonetic theory of this sort reflects the fact that two segments of a signal, represented by two symbols of the universal alphabet, may be alike in certain respects and distinct in others. There are a fixed number of such dimensions of sameness and difference and a fixed number of potentially significant points along these dimensions. Thus, the initial segments of *pin* and *bin* differ with respect to voicing and aspiration but not (significantly) with respect to point of articulation. The two consonants of *cocoa* differ with respect to neither point of articulation nor voicing, but only with respect to aspiration.

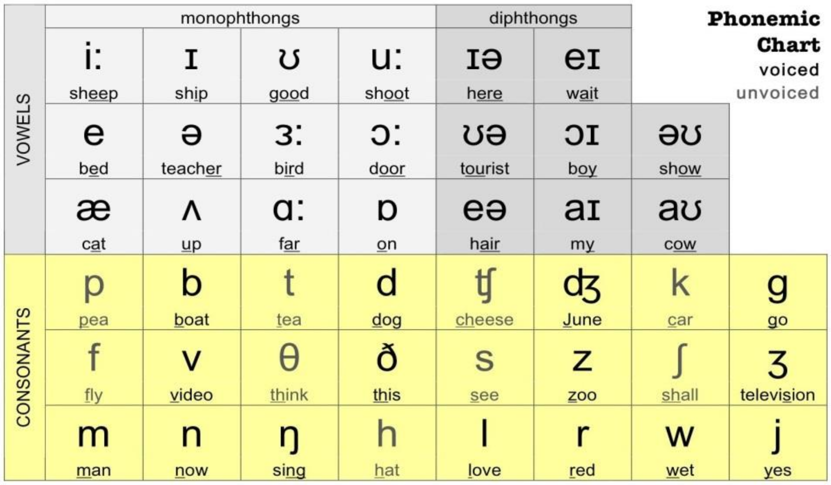
It is important to note that the distinctive features postulated in universal phonetic theory are absolute in several senses but relative in others. They are absolute in the sense that they are fixed for all languages. If phonetic representation is to provide sufficient information for identification of a physical signal, then specification of feature values must also be absolute. On the other hand, the features are relative when considered in terms of the notion of repetition/non-repetition. In addition to a system of distinctive features, a universal phonetic theory will also attempt to formulate certain laws that govern the permitted sequences and permitted variety of selection in a particular language.

Phonetics itself is the study of speech sounds. The subject of phonetics is the scientific study of the nature, use, and variety of all aspects of speech. To describe speech sounds it is necessary to know what an individual sound is, and how each sound differs from all others. A speaker of English knows that there are three sounds in word *cat*, the initial sound represented by the letter *c*, the second by *a*, and the final sound by *t*. Yet, physically the word is just one continuous sound. The speaker of English can segment the one sound into parts because he or she knows English. The ability to analyze a word into its individual sounds does not depend on knowledge of spelling. *Not* and *knot* have three sounds even though the first sound in *knot* is represented by the two letters *kn*.

Alphabetic spelling represents the pronunciations of words. However, orthography does not represent the sounds of the words in a language systematically. It is confusing to discuss the production of the different sounds as they are spelled in English words. The difference between spelling and sounds gave rise to a movement of spelling reformers called *orthoepist*. They want to revise the alphabet so that one letter would correspond to one sound and one sound to one letter. Then they created a phonemic alphabet to simplify spelling.

In 1888 the interest in the scientific description of speech sound led the International Phonetic Association (IPA) to develop a phonetic alphabet to symbolize the sounds of all languages. Since many languages use a Roman alphabet like that used in the English writing system, the phonetics alphabet utilized many Roman letters as well as invented symbols. These alphabetical characters which later called International Phonetic Alphabet (IPA) have a consistent value, unlike ordinary letters that may or may not represent the same sounds in the same or different languages. The table below presents one example of IPA in English.

Table. 1 Phonemic Symbols Chart in English



Phonemic Chart
voiced
unvoiced

	monophthongs				diphthongs			
VOWELS	iː sheep	ɪ ship	ʊ good	uː shoot	ɪə here	eɪ wait		
	e bed	ə teacher	ɜː bird	ɔː door	ʊə tourist	ɔɪ boy	əʊ show	
	æ cat	ʌ up	ɑː far	ɒ on	eə hair	aɪ my	aʊ cow	
CONSONANTS	p pea	b boat	t tea	d dog	ʧ cheese	ʤ June	k car	g go
	f fly	v video	θ think	ð this	s see	z zoo	ʃ shall	ʒ television
	m man	n now	ŋ sing	h hat	l love	r red	w wet	j yes

9. Universal Semantics

Universal system of semantic features and laws regarding their interrelations and permitted variety. In fact, the problem of determining such features and such laws has once again become a topic of serious investigation in the past few years. It can be seen at once that an analysis of concepts in terms of such features as animateness, action, etc., will hardly be adequate, and that certain features must be still more abstract. It is, for example, a fact of English that the phrase “a good knife” means “a knife which cuts well.” Consequently, the concept “knife” must be specified in part in terms of features having to do with characteristic functions (not just physical properties), and in terms of an abstract “evaluation feature” that is determined by such modifiers as “good,” “terrible,” etc. Only by such an analysis can the semantic relationship between “this is a good knife” and “this knife cuts well” be established. In contrast, the irrelevance of “this is a good knife for digging with” to “this knife cuts well” shows that the semantic interpretation of a sentence is determined by grammatical relations of a sort that are by no means transparent. As in the case of universal phonetics, we might hope to establish general principles regarding the possible systems of concepts that can be represented in a human language and the intrinsic connections that may exist among them. With the discovery of such principles, universal semantics would become a substantive discipline. Semantic understanding of natural language is fundamental for many applications that take natural language texts as partof their input.

Universal Semantics would better be conceived of as an induced universal that follows from the analytical ones plus the trivial constraint mentioned above, namely that humans can only use concepts within the range of their cognitive capacities. By contrast, let us now consider an example of a universal semantic property that clearly could only be called synthetical right from the outset. Since semantics is concerned with the correlation between form and content of signs, the simplest kind of synthetical semantic universal would state that certain linguistic signs occur in all languages. This presupposes that there are phonological forms which occur in all languages of the world. Since phoneme inventories differ considerably (cf. Maddieson 1984), and so do phonotactic constraints, this is a problematic assumption. Yet, some simple syllables like ka and pa seem to pertain to all languages; therefore, it is conceivable that there are also universally shared meanings associated with them. But there aren't any. What comes closest to this very concrete kind of semantic universal is the so-called global etymologies, families of related forms, paired with related meanings which can be reconstructed in all language families of the world (cf. Bengtson and Ruhlen to appear). But at present, the status of these etymologies must rather be called tentative, and so we are left without a good example for our first, most straightforward kind of semantic universal. So we have to look for more abstract types of universal properties, such as meanings universally encoded not by expressions with a given phonological form, but with given syntactic properties, i.e., belonging to a certain syntactic category. This is the kind of universal Johan van Benthem (this volume) is interested in, who defines semantic universals as general laws about meanings expressible in all human languages. The main question is: How are they expressed? If all languages have, in principle, the same general-purpose expressive power, as seems reasonable to assume, the differences must lie in the kind, especially in the size of the linguistic sign needed to encode a given meaning. One language may possess a single word to express a meaning another language would need a whole story to encode.

It has been suggested (e.g., in Zaefferer 1990) that the hierarchy of coding (1) reflects some hierarchy of basicness in the notional structure of a given language: The lower a means of encoding in the hierarchy, the more fundamental the encoded concept. (1) grammatical (unmarked) < grammatical (marked) < lexical (root) < lexical (stem) < lexical (compound) < phrasal Singularity, for instance, is in most languages a more basic concept than plurality, since, although both concepts may be encoded by grammatical means like inflection, plurality tends to be more marked.4 Likewise, in English, four (root), forty (stem), four hundred.

Types of Word Meaning

Word meaning is made up of various components which are interrelated and interdependent. These components are commonly described as types of meanings. Two main types of word meaning are **grammatical** and **lexical**.

A. Grammatical meaning:

Grammatical meaning consists of word-class and inflectional paradigm.

1. Word-class:

When a dictionary lists the function of a word, the definition does at least two things: it describes the word's lexical meaning and also gives what is traditionally known as the part of speech of the word, which modern linguists call the word-class; e.g.: *modern* will be marked as an adjective, *modernize* as a verb, and *modernization* as a noun. The word-class is essential, for when we use a word in a sentence, we have to take into consideration two factors: its specific lexical meaning and the position it normally occupies in a sentence, which is determined by the word-class to which the word belongs.

2. Inflectional paradigm:

When used in actual speech, words appear in different forms; e.g.: *cat-cats, mouse-mice; to walk, walks walked, to write, writes, wrote, written*, etc. The set of grammatical forms of a word is called its paradigm. Nouns are declined, verbs are conjugated, and gradable adjectives have degrees of comparison. The lexical meaning of a word is the same throughout the paradigm; that is, all the word-forms of one and the same word have the same lexical meaning, yet the grammatical meaning varies from one word-form to another, e.g.: *cat* is grammatically singular in meaning while *cats* is plural; *writes* denotes third person, singular, present tense, whereas *wrote* denotes past tense.

B. Lexical meaning

Another component of word meaning is lexical meaning, which is different from grammatical meaning in two aspects: first, the lexical meaning of a word is the same in all the forms of one and the same word while the grammatical meaning varies from one word-form to another; second, every word has a different lexical meaning, whereas the grammatical meaning is the same in identical sets of individual forms of different word. Hence we may describe lexical meaning as that component of meaning proper to the word as a lexical item. Lexical meaning may be subdivided into denotative meaning, connotative meaning, social meaning and affective meaning.

1. Denotative meaning/conceptual meaning

Denotative meaning is sometimes called the conceptual meaning. It is the central factor in linguistic communication. One of the functions of words is to designate or describe something, such as an object, a property, a process or a state of affairs. Users of a language cannot talk about their knowledge of a physical object or a natural phenomenon, unless this knowledge is expressed in words which have the same meaning for all speakers of a given community. This is the denotative meaning of a word.

The denotative meaning of a word is its definition given in a dictionary. It is that aspect of lexical meaning which makes communication possible. There is no doubt that a chemist knows more about *wate*r than a layman, or that a physician possesses a much deeper knowledge of what *edema* implies than a patient. Nevertheless, a layman and a chemist or a physician and his patient can both use the words *water* and *edema*, and understand each other. Therefore, denotative meaning is the central factor in linguistic communication.

2. Connotative meaning/ associative meaning

Connotative meaning refers to the emotional association which a word or a phrase suggests in one’s mind; it is the supplementary value which is added to the purely denotative meaning of a word. For instance, the denotative meaning of the word *mother* is “female parent”, but it generally connotes love, care, and tenderness. The word January denotes” the first month of the year”, but the connotations of the word may include cold weather, a biting north wind, snow, central heating, skating or the New Year.

Connotations may be considered on two levels: connotations pertaining to individuals and connotations pertaining to a group.

Each individual has his own sphere of experience, and his connotations of words may well be based on personal experience with the referent. For example, *father* will have different connotations for different people because of their individual experiences. Tradition, physical environment, education, and a common cultural background link people into a whole. And the people who from such an entity share much in the way of outlook and attitudes. So the same word or expression may not possess the same connotation to people of different countries. Take the word *communist* for example, it is almost a term of abuse in some countries but a term of praise in others.

3. Social or stylistic meaning:

Language must be adjusted to fit different contexts or situations where it is used for a specific purpose; one adjusts one’s language so as to make it appropriate in various situations in terms of（1）social relationship between the speakers or correspondents which may be that of friend to friend, or professor to student; (2) the occasion which may be a class reunion or an official reception; (3) subject matter which may be about serious political issues or about films, swimming or food; (4) the mode of discourse spoken or written. We have a scale of speech styles as shown in the following quotation:

Consultative and casual styles occur in everyday use. Consultative style is a polite and fairly neutral style; it is used when we are talking to a person whom we do not know well, or to someone who is senior to ourselves in terms of age or social position. Common words are used in this style. Casual style is used in conversation between friends or in personal letters, when the language is informal, familiar, relaxed, warm and friendly. A word or meaning labeled *colloquial* of *informal* is appropriate in the casual or intimate style. The frozen and intimate styles do not have much practical use for us. We may further simplify the style into three levels: formal, neutral and informal. None of these styles is better than any other; appropriateness is the key to the good use of the various styles.

4. Affective meaning:

Affective meaning is concerned with the expression of feelings and attitudes of the speaker or writer. There are a small number of words in English whose main function is to express emotion. Some words are used not as a mere statement of fact, but to express the speaker's approval of the person or thing he is talking about. They are *pure words*. On the other hand, words like *gang*, *niggardly*, and to *boast* always show disapproval or contempt on the part of the speaker. They are snarl words. Such words are permanently charged with emotion, even when they appear in isolation. Therefore, affective meaning is one of the objective semantic features proper to words as lexical items, and forms part of the word meaning, independent of the associations of the individual.

10. Universal Grammar

Universal Grammar or UG has been a popular term since the early 1980s, or more precisely since the publication of Chomsky s (1981) *Lectures on Government and Binding*. Despite its popularity, however, the term has met diverse reactions. Because UG theory deals with highly abstract linguistic principles, it is mostly comprehensible to few scholars of formal linguistics but often partly or even totally puzzling to many students of language. Moreover, because of its big claims in linguistic theorizing, UG may have been taken as a whole truth, a partial truth, or even an abstract nonsense. Among hard-core Chomskyans, UG is seen as the best possible theory for its (claim of) explanatory adequacy. Among those who see language both as a social construct and a mental reality, UG may at best be taken as half a truth, because it deals with language only as a psychological fact while ignoring social aspects of language. Among those who commit themselves to linguistics of particularity (e.g., Becker 1995), UG remains up there in the abstract and fails to show the local significance of language as used in its cultural context.

Taking into account these diverse reactions to UG, this article presents a brief historical and critical overview of UG, highlighting its inception and its changing characteristics through half a century of its development, and taking a closer look at its theoretical claims so as to prove that not all of them are justified empirically.

UNIVERSAL GRAMMAR IN A CHRONOLOGICAL PERSPECTIVE

One important key word in the generative enterprise is theory, and Chomsky is best at linguistic theorizing. In Chomskyan linguistics today, UG holds the center of generative theory. However, UG, as now understood in the generative school, did not come into being in a sudden blow; but rather it had taken a slow process of becoming.

Below I will describe how and explain why UG came into existence, and point out each phase in which UG has undergone internal changes as generative theory has undergone revision and reformulation.

a. Toward Universal Principles

The so-called Chomskyan Revolution began in 1957, when Chomsky published his now monumental classic *Syntactic Structures*. The revolutionary ideas, still relevant today as seen against its historical background, loom large in at least four important ways.

First, syntax moves to the center stage of linguistics, replacing phonemics and morphemics which were the hallmarks of American Structuralism. Chomsky (1957: 11) defines syntax as the study of principles and processes by which sentences are constructed in particular languages. Notice that the phrase principles and processes in the definition suggest a cognitive or mental activity, since for him a grammar mirrors the behavior of the speaker who ... can produce or understand an indefinite number of sentences (p. 15). A careful reading of grammar defined that way reveals the seminal idea of *linguistic competence*.

Second, the introduction of the transformational component to syntactic description is meant to overcome the weakness of the immediate constituent (IC) analysis; for the IC model fails to see, for example, the inherent relation between active and passive sentences (p. 6). Lingering behind the transformational model are the embryonic ideas of *deep structure* and *surface structure*. The deep structure also peeps secretively behind Chomsky s exposition of syntactic ambiguity (pp. 87-88), as illustrated by the following examples.

(1) a. flying planes
    b. the shooting of the hunters

Each of these phrases has two possible interpretations, as made explicit in (2).

(2) a. i. planes which are flying
    ii. to fly planes
  b. i. the shooting of the hunters (of a tiger)
    ii. the (soldier s) shooting of the hunter

The ambiguity in (1.a) is due to the fact that the verb *fly* can be used either transitively or intransitively, whereas the ambiguity in (1.b) lies in possible omission of the object or subject of *shoot* in the gerundial phrase *the shooting of the hunter*. Syntactically ambiguous constructions are constructions having one surface structure but two or more deep structures. In other words, surface structure and deep structure constitute an inseparable pair of devices necessary for adequate syntactic description, the former referring to observable form and the latter to hidden meaning.

Third, linguistic meaning or semantics, long neglected by Bloomfieldian scholars (see Bloomfield 1933: 140), is now given its due attention. There are many important correlations, quite naturally, between syntax and semantics (Chomsky 1957: 108); and these correlations could form part of the subject matter for a more general theory of language concerned with syntax and semantics and their points of connection.

However, syntax is best formulated as a self-contained study independent of semantics (p. 106). The now well-known linguistic nonsense

(3) Colorless green ideas sleep furiously (p. 15)

is given as evidence that grammar is autonomous and independent of meaning (p. 17). That is, while sentence (3) is semantically ill-formed, it is nonetheless syntactically well-formed. This is to prove that, in an extreme case, syntax may exist without semantics. With regard to their theoretical positions, syntax is given a central role whereas semantics is assigned a marginal position. It is syntax, and not semantics, that generates grammatical sentences in a language (p. 13). This is the reason in later development for calling syntax *generative* and semantics *interpretive.*

Fourth and finally, *Syntactic Structures* is best seen as a rigorous attempt to build linguistic theory, and has proven to be a remarkable success. Chomsky claims that the ultimate outcome of [syntactic] investigations should be a theory of linguistic structure in which the descriptive devices utilized in particular grammars are presented and studied abstractly with no specific reference to particular languages (p. 11). This statement implies that syntactic description is only a beginning unlike in the Bloomfieldian school where description of an individual language is an end in itself

(Sampson, 1980), and hence the name Descriptive Linguistics. The upward movement from particular grammars to abstract principles or general grammars goes hand in hand with the progressive movement from linguistic description to linguistic explanation. These parallel movements are important steps toward theory building, or using Chomsky s own words toward the explanatory power of linguistic theory (p. 49).

To recapitulate, lingering behind *Syntactic Structures* are seminal ideas ready to leap up to become vocabulary of concepts in the Chomskyan school: *generative, linguistic competence, transformation, surface structure, deep structure.* All of these are key concepts necessary for outlining the centrality of syntax. Indeed, a grammar of the language L is essentially a theory of L (p. 49). While the illustrative examples presented in support of theory building are all in English, the book has in it deep insights into establishing general or universal principles in syntactic theory. And a good theory should be internally *simple* (p. 55) and externally meet *conditions of adequacy* (p. 49) both to be explained shortly.

Universal and Particular Grammars

The publication of *Aspects of the Theory of Syntax* (1965) signifies the maturity of the new school; it makes the so-called Transformational Generative Grammar a well-established linguistic theory. In this second monumental book, all seminal ideas lingering in *Syntactic Structures* are used explicitly as formal terms. Chomsky (1965: 2-4) claims that linguistic theory is concerned primarily with *linguistic competence*. Loosely defined, linguistic competence means a specific mental ability that enables humans to produce and understand novel grammatical utterances (see Fromkin et al. 1997: 70). The actual use of competence in concrete situations is known as *performance*. Just as *deep structure* and *surface structure* are necessary devices for complete and accurate sentence derivation, competence and performance are necessary devices for adequate linguistic description.

The above definition of competence suggests two basic assumptions in Generative Grammar. The first assumption is that human language is fundamentally creative. In the everyday act of speaking or writing, we normally produce or create novel grammatical utterances. Similarly, in the act of listening or reading, we assign meaning to utterances which probably we have never encountered before. This is what Chomsky (1966: 3-31) calls the creative aspect of language use. Subsequently, he defines language as an expression of the human mind rather than a product of nature; [it] is boundless in scope and is constructed on the basis of a constructive principle that permits each creation to serve as the basis for a new creative act

(Chomsky 1972: 102). Formally, the constructive principle that accounts for linguistic creativity is represented by PS rules 1 which may recur indefinitely. Moreover, Chomsky (1972: 56) believes that the essential feature of language is not its structure, but its creative use. Metaphorically, language is a mirror of the mind (ibid., pp. ix-x). Since the human mind is essentially creative, human language must be creative too.

The second basic assumption is that language is a mental or psychological fact. This assumption is further confirmed by the statement, linguistic theory is mentalistic, since it is concerned with discovering a mental reality underlying actual [linguistic] behavior (p. 4). At this point the term *generative* is helpful. Generative means specifying the rules, or more clearly, making the hidden linguistic rules in the mind explicit. How does Chomsky do this? He proposes a model (Figure 1) showing how grammatical sentences are generated.

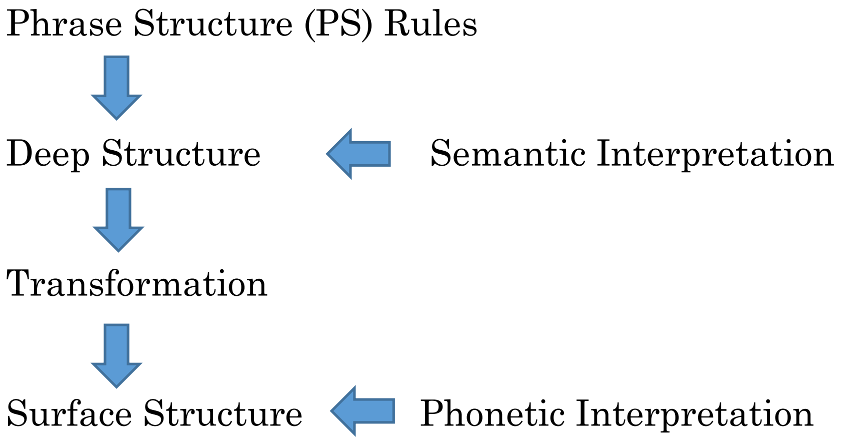


Figure 1. Diagrammatic Representation of Linguistic Competence

It should be noted that this model is a rough outline of linguistic competence. According to this competence model, sentence generation proceeds as follows. PS (Phrase Structure) rules, followed by lexical insertion, produce a kernel sentence at the deep structure (DS). The kernel sentence obtains its meaning or semantic interpretation at the DS. The transformational rules apply, either obligatorily or optionally, to the kernel sentence at the DS, producing the surface structure (SS). The sentence at SS obtains its phonetic interpretation, producing an actual utterance as used in concrete situations.

Notice that *PS Rules, Deep Structure, Transformation,* and *Surface Structure* in Figure 1 are four major components that constitute **syntax**. The model clearly shows that syntax is given a central position, and hence it is *generative*. On the other hand, **semantics** and **phonology** are assigned marginal position, and hence they are *interpretive*. In other words, in generative theory syntax is central and autonomous, whereas semantics and phonology are marginal and dependent on syntax. The competence model in Figure 1 is assumed to be a general, and hence universal, model of linguistic competence for any speaker-hearer of any language. Of course, since the illustrative examples in *Aspects* are all in English, adjustments of rules are required. For example, Phrase Structure (PS) rules and transformational rules suitable for English may not be suitable for Indonesian, and hence the necessity of rules adjustments.

A relevant question arises: how does linguistic competence come into being? As shown in Figure 1, linguistic competence is exceedingly complex; and yet after approximately three years of exposure to language use, children will normally acquire competence. This curious phenomenon is known as the logical problem of language acquisition (see Chomsky 1965: 58). That is, how come human children know so much about language when they are exposed to so little of it? In response to this logical problem, Chomsky (ibid., p. 47) proposes the LAD (*language acquisition device*) hypothesis. The language acquisition device is a psycho-biological disposition which enables human children to acquire language. The LAD is much like a linguistic blueprint.

As shown in Figure 2, when exposed to language data, the LAD turns out into grammar or linguistic competence.

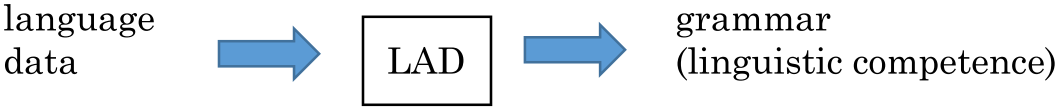


Figure 2. The LAD Hypothesis

The LAD hypothesis is proposed as a probable answer to the logical problem of language acquisition. Linguistic development in the young mind proceeds in a step-by-step manner. The LAD is equal to Grammar zero (G). As it is exposed to language use surrounding the child, the following process occurs: $G_0 \rightarrow G_1 \rightarrow G_2 \rightarrow G_3 \rightarrow \ldots$ Gn. This means exposure to language data triggers or activates innate principles within the LAD, making G_0 develop into G1, G2, G3, etc., and finally into G_n. G_n is adult grammar or linguistic competence. It is this adult grammar or linguistic competence that is the major concern of generative theory.

As noted at the end of section B.1, a well-grounded linguistic theory should be internally *simple* and externally meet *conditions of adequacy*. The simplicity of grammar shows up in Figure 1. The simple model reveals the components of linguistic competence, which operate together in a flow-chart manner so as to generate grammatical sentences.

As for external conditions of adequacy, there are two distinct levels: descriptive and explanatory adequacy. Avoiding technicality, *descriptive adequacy* means providing a complete and accurate description of a speaker-hearer s competence. If the description of competence in Figure 1 is complete and accurate, then the theory has accomplished descriptive adequacy. *Explanatory adequacy* means giving theoretically and empirically justified explanation of how humans are capable of acquiring and using language, despite its inherent structural complexity. If the LAD hypothesis proves to be true, then the theory has accomplished explanatory adequacy.

Going back to Figure 2, it is reasonable to assume that every set of language data (to which the LAD is exposed) always belongs to a particular language. Therefore, the resulting grammar is a grammar of a particular language. Chomsky (1972: 28) calls this kind of grammar *particular grammar*. He further maintains that a linguist is always involved in the study of both particular and universal grammar. In his attempt to describe a particular grammar, the linguist is guided by certain assumptions as to the form of possible grammar. If these assumptions are justified on empirical grounds, then they belong to the theory of *universal grammar*. Here we see theoretical abstraction. Particular grammars of individual languages are based on general principles. Taken together, these general principles constitute universal grammar an essential property of the human mind.

In summary, human language, best seen as a mirror of the mind, is fundamentally creative. As a mental fact, language is represented by linguistic competence; it is a particular grammar resulting from the LAD being exposed to specific language data. In depth analysis of individual languages will yield particular grammars; and yet deep down in human cognition there are innate principles, believed to be components of universal grammar and serve as basic foundations for particular grammars. Descriptive adequacy refers to complete and accurate description of particular grammars; and explanatory adequacy refers to justifiable explanation of the highly abstract nature of universal grammar.

LAD as Universal Grammar

In the *Aspects* model, the major concern of Generative Grammar, as noted earlier, was *linguistic competence*. Recall that linguistic competence is the same as Grammar or adult grammar of a particular language; and hence linguistic competence equals a *particular grammar*. Since particular grammars of different languages show much greater variation of rules than uniformity of principles, there has been a shift of focus in linguistic research. In line with Chomsky s ambition to attain explanatory adequacy, linguistic investigation since 1980s has been aimed directly at unraveling universal principles common for all languages. In other words, the goal of linguistic theory is to provide adequate description and explanation of Universal Grammar (UG). During the 1980s UG was at the center of the so-called Government and Binding (GB) Theory. Similarly, since the mid-1990s UG has remained at the center of the Minimalist Program. Both GB Theory and Minimalism are unified by the same approach: Principles-and-Parameters (P&P) approach.

The enormous change in the goal of linguistic theory (from describing linguistic competence to explaining UG) signifies two theoretical moves. First, generative theory moves deeper in a psychological sense, and hence becomes more strongly mentalistic in its approach. Secondly, generative theory moves to higher abstraction, claiming that UG is modular in its design, consisting of theories (such as bounding theory, government theory, theta theory, binding theory, Case theory, and control theory (Chomsky 1981: 5)) working in a simultaneous and interactive way in the mind so as to produce grammatical utterances. More explanation of these two theoretical moves is presented in order.

The deep move shows up, first of all, in the definition of UG itself. Chomsky (1975: 29) defines UG as the system of principles, conditions, and rules that are elements or properties of all human languages, not merely by accident but by [biological] necessity.

In *Aspects* (Chomsky 1965), the language acquisition device (LAD) was there as a black box, a mental device which enables human children to acquire language but unknown as of its properties. Now the deep move clearly suggests that the LAD is the system of principles, conditions, and rules (meaning grammar) that are elements or properties of all human languages (meaning universal), determined by biological necessity (meaning innate). More clearly, Smith (1999: 42) defines UG as the set of linguistic principles we are endowed with at birth in virtue of being human. Thus, in the classical approach, the major concern was linguistic competence; but in the P&P approach, the major concern is UG a new name for the LAD or Grammar. The linguistic competence is not totally excluded, but given a less prominent function: it is a gateway to understanding and explaining UG.

Secondly, the deep move implies that the central concept throughout is grammar, not language (Chomsky 1981: 4). Grammar is a deep-seated mental entity, whereas language is derivative from grammar. The centrality of grammar here reminds us of the centrality of competence. A newly coined term for grammar in this sense is introduced: *I-language*, where I is to suggest internal, individual, and intensional (Chomsky 1986: 22-24). Language is internal in that it deals with the inner state of one's mind, independent of elements in the outer world; it is individual in that it deals primarily with an ideal speaker-hearer, and only secondarily with his/her speech community; and it is intensional in that I-language is a function specified in intension (internal sentence sense), not extension (external world reference). The opposite of I-language is *E-language*, where E is to suggest external and extensional; and E-language, like linguistic performance, is excluded from the database of generative research.

The deep move from examining particular grammars to investigating Universal Grammar is in tandem with the abstract move to higher theories with greater power of generality. While in the *Aspects* model grammatical rules (e.g., transformational rules) were meant to be language-specific, in the P&P approach UG principles and parameters

are claimed to be universal. These principles and parameters are there like blueprints in the LAD, waiting to be activated through exposure to language data. In a technical sense, language acquisition means activating the innate principles and fixing the innate parameters as the child is exposed to a particular language. In a general sense, language acquisition can be regarded as language growth, that is, the growth of UG becoming a particular language. By way of analogy, Chomsky (1975: 9-11) remarks, language grows in the mind just as the arm grows out of the body; the former is the growth of a mental organ and the latter of a physical organ. Both are innate and genetically determined. In a philosophical sense, the P&P approach, according to Smith (1999: 141), may well be considered as *linguistic naturalism*. That is, like geology, physics, or biology, linguistics is conducted according to the methodology of the natural sciences, ... though it need not follow that linguistics is reducible to hard sciences.

As outlined above, the internal mechanism of generative theory has undergone tremendous change. But some fundamental concepts have remained the same. Syntax has remained at the center of generative theory, and semantics in the periphery. Note that in the course of half a century, Chomsky has been preoccupied with theory building. In fact, *theory* has become *the key concept*. As noted earlier (see footnote 5), grammatical rules have been condensed into interactive modules, all named theories. In linguistic theorizing, generative theory has been internally and continually driven toward greater simplicity and elegance (Chomsky 1981: 14-15). Externally, the theory has made less effort to meet the condition of descriptive adequacy but more effort to meet the condition of explanatory adequacy. Finally, it should be noted in passing that Generative Grammar has remained a *context-free* linguistics. All the big theories have been proposed to account for *grammaticality* and *ungrammaticality* of syntactic constructions and nothing more.

To summarize, in the *Aspects* model, UG was left vaguely in the shade; but in the P&P approach it is drawn to the center of generative theory. UG is another name for the LAD in state zero, just as linguistic competence is another name for a particular (adult) grammar. In the *Aspects* model, a full description of particular grammars was required as a way to disclosing universal principles. In the P&P approach, the nature of UG can be disclosed directly though in-depth analysis of a few languages, or even a single language (Chomsky 1981: 6). Briefly, Generative Grammar, taking UG as the primary goal of linguistic theory, has moved to deeper mentalism and higher abstraction, maintaining the belief that language is nothing but mental grammar.

Conclusion

Chomsky triggered a revolution when he explored language hierarchy, a method of classification that has impacted the computer science field as well. His linguistic discoveries have also benefited the field of psychology. Chomsky contributed to the literary field with a plethora of books and has been recognized for his work as an activist, philosopher, scientist, and professor with numerous honorary degrees and awards, including the Benjamin Franklin Medal in Computer and Cognitive Science and the American Psychological Association's Distinguished Scientific Contribution Award. As one of the science "legendaries" who is still alive, we can expect to still hear more about him in coming years.

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